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EXAMINER	
VIANA DI PRISCO, GERMAN	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/617,363	WU ET AL.	
	Examiner	Art Unit	
	GERMAN VIANA DI PRISCO	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 May 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8-13,16-28,30-37 and 42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-6, 8-13, 16-28, 30-37, and 42* is/are rejected.

7)☒ Claim(s) *2* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the Pre-Appeal Brief Request for Review filed on 05/09/2008. As a result of the Review the previous final rejection is withdrawn. In the remarks filed on 03/10/2008 after the final rejection, the Applicant noted that the reasons for rejecting claims 30 and 33 did not appear in the mailed document. The reasons for rejecting claims 30 and 33, which were inadvertently omitted in the previous action are now included.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 3-5, 11, 34, 35 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barlev et al. (Barlev", United Sates Patent Application Publication No.: US 2005/0220180 A1) in view of Pedersen et al. ("Pedersen", United States Patent No.: US 7,006,500 B1) and further in view of Kukic (United Sates Patent Application Publication No.: US 2003/0169780 A1).

Consider claim 1, Barlev discloses a system for transmitting a DS3 (T3, paragraph[0111]) data stream over a few twisted pair conductors(paragraph [0031]) comprising: a high speed data interface(SCM 274 in figure 7 and paragraphs [0111] and [0143]) adapted to receive said DS3 data stream and to inversely multiplex said high speed data stream into parallel data streams (paragraph [0031]), and a plurality of modems adapted to modulate each corresponding stream of packets onto a twisted pair conductor (paragraph [0143]).

However Barlev does not explicitly disclose that the DS3 data stream is inversely multiplexed into four streams that each comprise an approximately 11 megabits per second stream (Mbps) or that the data streams modulated by the modems corresponds to 13 Mbps or a framer adapted to receive each of said parallel data streams, and to generate a stream of packets, each packet having a packet index number and a packet stream number corresponding to its respective data stream.

In the same field of endeavor Pedersen discloses a framer (Bonded Link Interface 26 in figure 1B) adapted to receive each of said parallel data streams (column 6, lines 63-67), and to generate a stream of packets, each packet having a packet index number (Sequence Number) and a packet stream number(User Flow Identification) corresponding to its respective said parallel data stream(figure 5 and column 7 line 30-column 8 line 24)

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made for a framer to include a packet index number and a packet stream number corresponding to its respective data stream as disclosed by Pedersen in the system of Barlev in order to efficiently utilize the available link capacity and more fluidly handle differences in link speed.

Regarding the data rate modulated by the modems corresponding to 13 Mbps, it is obvious that if overhead is added to each packet (e.g. in the form of a sequence number and a stream number) then the data rate is bound to increase. However the Applicants have not disclosed that having an overhead of approximately 2 Mbps provides an advantage. One of ordinary skill in the art, furthermore would have expected Applicants' invention to perform equally well with the overhead as taught by Pedersen et al because both overheads perform the same function of re-sequencing the data flows transmitted across twisted pairs.

Therefore, it would have been obvious to one of ordinary skill in the art to modify Pedersen et al to obtain the invention as specified in claim 1.

Nonetheless Barlev as modified by Pedersen et al does not expressly disclose

that the DS3 data stream is inversely multiplexed into four streams that each comprise an approximately 11 megabits per second stream (Mbps).

In the same field of endeavor Kukic discloses that DS3 data stream (ATM data stream) is divided over several lower capacity lines whose number depends on the data rate of these lower capacity lines and that if the received data rate is four times the optimal rate of the lower capacity lines, the incoming DS3 stream will have to be inverse multiplexed onto by four lines (11 Mbps is approximately $1/4^{th}$ of a DS3).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to divide a DS3 over four lines as disclosed by Kukic in the system of Barlev as modified by Pedersen in order to optimally calculate a data rate.

Consider claim 3 and as applied to claim 1 above, Barlev further discloses the number of parallel data streams being fewer than twenty two (in Table 1 in page 18 the number parallel data streams required for 45 Mbps and a distance of 6000 ft is 14).

Consider claim 4 and as applied to claim 1 above, Barlev as further discloses directing the bits if the DS3 data stream to the parallel data streams in accordance with a round robin pattern (paragraph [0113]).

Consider claim 5 and as applied to claim 2 above Barlev as modified by Pedersen and further modified by Kukic does not disclose the second byte comprising stuffing bits to allow the inverse multiplex operation of said high speed data interface to vary the number of bytes in a packet.

However Pedersen discloses using stuffing bits to allow the inverse multiplex operation of said high speed data interface to vary the number of bytes in a packet

(column 2, lines 22-29).

Consider claim 11, and as applied to claim1 above Barlev further discloses a system for transmitting high speed data over a plurality of relatively low bandwidth unshielded twisted copper pairs comprising a plurality of DSL modems that conform to the T1E1.4 HDSL2 standard which implies the use of a low frequency band in the upstream direction and a high frequency band for the downstream direction (paragraph [0116]).

Consider claim 34, Barlev discloses a method for transmitting a DS3 (T3, paragraph [0111]) data stream over a few twisted pair conductors (paragraph [0031]) comprising receiving said DS3 data stream (paragraph [0111]); inversely multiplex said DS3 data stream into parallel data streams (paragraph [0031]); generating a stream of packets (paragraph [0148]), and modulating each corresponding stream of packets onto a twisted pair conductor (paragraph [0143]).

However Barlev does not explicitly disclose that the DS3 data stream is inversely multiplexed into four streams that each comprise an approximately 11 megabits per second stream (Mbps) or that the data streams modulated by the modems corresponds to 13 Mbps or that each packet has a packet index number and a packet stream number corresponding to its respective data stream.

In the same field of endeavor Pedersen discloses a frame header that includes a packet index number (Sequence Number) and a packet stream number (User Flow Identification)corresponding to its respective data stream (figure 5 and column 7 line 30-column 8 line 24).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include a packet index number and a packet stream number corresponding to its respective data stream as disclosed by Pedersen in the system of Barlev in order to efficiently utilize the available link capacity and more fluidly handle differences in link speed.

Regarding the data rate modulated by the modems corresponding to 13 Mbps, it is obvious that if overhead is added to each packet (e.g. in the form of a sequence number and a stream number) then the data rate is bound to increase. However the Applicants have not disclosed that having an overhead of approximately 2 Mbps provides an advantage. One of ordinary skill in the art, furthermore would have expected Applicants' invention to perform equally well with the overhead as taught by Pedersen because both overheads perform the same function of re-sequencing the data flows transmitted across twisted pairs.

Therefore, it would have been obvious to one of ordinary skill in the art to modify Pedersen to obtain the invention as specified in claim 34.

Nonetheless Barlev as modified by Pedersen does not specifically disclose that the DS3 data stream is inversely multiplexed into four streams that each comprises an approximately 11 megabits per second stream (Mbps).

In the same field of endeavor Kukic discloses that DS3 data stream (ATM data stream) is divided over several lower capacity lines whose number depends on the data rate of these lower capacity lines and that if the received data rate is four times the optimal rate of the lower capacity lines, the incoming DS3 stream will have to be inverse

multiplexed onto by four lines (11 Mbps is approximately 1/4th of a DS3).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to divide a DS3 over four lines as disclosed by Kukic in the system of Barlev as modified by Pedersen in order to optimally calculate a data rate.

Consider claim 35 and as applied to claim 34 above, Barlev as modified by Pedersen and further modified by Kukic discloses directing the bits if the DS3 data stream to the parallel data streams in accordance with a round robin pattern (paragraph [0113]).

Consider claim 42, and as applied to claim 34 above Barlev further discloses a system for receiving a high speed data over a plurality of relatively low bandwidth unshielded twisted copper pairs comprising a plurality of DSL modems that conform to the T1E1.4 HDSL2 standard which implies the use of a low frequency band in the upstream direction and a high frequency band for the downstream direction (paragraph [0116]).

6. Claims 6, 28 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barlev et al. ("Barlev", United Sates Patent Application Publication No.: US 2005/0220180 A1) in view of Pedersen et al. ("Pedersen", United States Patent No.: US 7,006,500 B1) and further in view of Sheets et al. ("Sheets", United Sates Patent No.: 5,437,023).

Consider claim 6, Barlev discloses a system for transmitting a high speed (T3, paragraph[0111]) data stream over plurality of twisted pair conductors(paragraph

[0031]) comprising a high speed data interface(SCM 274 in figure 7 and paragraphs [0111] and [0143]) adapted to receive said high speed data stream and to inversely multiplex said high speed data stream into a plurality of parallel data streams (paragraph [0031]); a framer adapted to receive each of said parallel data streams , and to generate a stream of packets(inherently taught in paragraph [0148]), and a plurality of modems adapted to modulate each corresponding stream of packets onto a twisted pair conductor (paragraph [0143]; and a processor (276 in figure 7).

However Barlev does not explicitly disclose a framer adapted to receive one of said parallel data streams, and to generate a stream of packets, each packet having a packet index number.

In the same field of endeavor Pedersen discloses a framer (Bonded Link Interface 26 in figure 1B) adapted to receive each of said parallel data streams (column 6, lines 63-67), and to generate a stream of packets, each packet having a packet index number(Sequence Number) (figure 5 and column 7 line 30- column 8 line 24).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made for a framer to include a packet index number as disclosed by Pedersen in the system of Barlev in order to efficiently utilize the available link capacity and more fluidly handle differences in link speed.

Nonetheless Barlev as modified by Pedersen does not specifically disclose that the processor is adapted to identify a loopback code in said high speed data stream, wherein said processor is further adapted to pass through a first received loopback code to another device, and to enter a loopback mode if an nth subsequent loopback

code is received without an intervening loop down code.

In the same field of endeavor Sheets discloses passing through a first received loopback code to another device (the loopback code is transmitted along the transmit line 36 to all repeaters), and to enter a loopback mode if an nth subsequent loopback code (loopback code is repeated for three seconds) is received without an intervening loop down code (figure 1 and column 10 lines 53-61).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to pass through a loopback code and to enter a loopback mode if an nth subsequent loopback code is received as disclosed by Sheets in the system of Barlev as modified by Pedersen et al in order to execute a loopback command without causing other line elements to enter loopback as well.

Consider claims 28, Barlev discloses a system for receiving a high speed (T3, paragraph[0111]) data stream over a few twisted pair conductors(paragraph [0031]) comprising: a plurality of modems (290 in figure 8)adapted to demodulate a plurality of parallel signals received over said plurality of twisted pair conductors into a plurality of data streams (301 in figure 8) each comprising a stream of packets (figure 8 and paragraphs [0154]-[0155]) and a high speed data interface adapted to receive said plurality of synchronized parallel data streams and to multiplex said plurality of parallel data streams into said high speed data stream (paragraph [0111]).

However Barlev does not explicitly disclose each packet having a stream identifier and a packet number deframer adapted to receive said parallel streams of packets, and to synchronize packets from said parallel streams based on said stream

identifiers and packet numbers.

In the same field of endeavor Pedersen discloses a frame header that includes a packet index number (Sequence Number) and a packet stream number (User Flow Identification)corresponding to its respective data stream (figure 5 and column 7 line 30-column 8 line 24) and a deframer (Bonded Link Interface 26 in figure 1B) adapted to receive said parallel streams of packets, and to synchronize packets from said parallel streams based on said stream identifiers and packet numbers; a high speed data interface adapted to receive said plurality of synchronized parallel data streams and to multiplex said plurality of parallel data streams into said high speed data stream (column 6, line 67- column 7, line 67).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include a packet index number and a packet stream number corresponding to its respective data stream and a deframer as disclosed by Pedersen et al in the system of Barlev in order to efficiently utilize the available link capacity and more fluidly handle differences in link speed.

Nonetheless Barlev as modified by Pedersen does not specifically disclose a processor adapted to identify a loopback code in said high speed data stream wherein said processor is further adapted to pass through a first received loopback code to another device, and to enter a loopback mode if an nth consecutive loopback code is received without an intervening loop down code.

In the same field of endeavor Sheets discloses passing through a first received loopback code to another device (the loopback code is transmitted along the transmit

line 36 to all repeaters), and to enter a loopback mode if an nth subsequent loopback code (loopback code is repeated for three seconds) is received without an intervening loop down code (figure 1 and column 10 lines 53-61).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to pass through a loopback code and to enter a loopback mode if an nth subsequent loopback code is received as disclosed by Sheets et al in the system of Barlev et al as modified by Pedersen et al in order to execute a loopback command without causing other line elements to enter loopback as well.

Consider claim 37, Barlev discloses a system for transmitting a high speed (T3, paragraph [0111]) data stream over plurality of twisted pair conductors (paragraph [0031]) comprising receiving said high speed data stream (paragraph [0031]); inversely multiplexing said high speed data stream into a plurality of parallel data streams (paragraph [0031]) and modulating each corresponding stream of packets onto a twisted pair conductor (paragraph [0143]).

However Barlev does not explicitly disclose generating a stream of packets, each packet having a packet index number.

In the same field of endeavor Pedersen discloses generating a stream of packets, each packet having a packet index number(Sequence Number) and a packet stream number(User Flow Identification) corresponding to its respective said parallel data stream(figure 5 and column 7 line 30- column 8 line 24).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made for a framer to include a packet index number and a

packet stream number corresponding to its respective data stream as disclosed by Pedersen in the system of Barlev in order to efficiently utilize the available link capacity and more fluidly handle differences in link speed.

Nonetheless Barlev as modified by Pedersen does not specifically disclose identifying a loopback code in said high speed data stream, wherein said processor is further adapted to pass through a first received loopback code to another device, and to enter a loopback mode if an nth subsequent loopback code is received without an intervening loop down code.

In the same field of endeavor Sheets discloses passing through a first received loopback code to another device (the loopback code is transmitted along the transmit line 36 to all repeaters), and to enter a loopback mode if an nth subsequent loopback code (loopback code is repeated for three seconds) is received without an intervening loop down code (figure 1 and column 10 lines 53-61).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to pass through a loopback code and to enter a loopback mode if an nth subsequent loopback code is received as disclosed by Sheets in the system of Barlev as modified by Pedersen in order to execute a loopback command without causing other line elements to enter loopback as well.

7. Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barlev et al. (“Barlev”, United Sates Patent Application Publication No.: US 2005/0220180 A1) in view of Pedersen et al. (“Pedersen”, United States Patent No.: US

7,006,500 B1).

Consider claims 25, Barlev discloses a system for receiving a DS3 (T3, paragraph[0111]) data stream over a few twisted pair conductors(paragraph [0031]) comprising: a plurality of modems (290 in figure 8)adapted to demodulate a plurality of parallel signals received over said plurality of twisted pair conductors into a plurality of data streams (301 in figure 8) each comprising a stream of packets (figure 8 and paragraphs [0154]-[0155]) and a high speed data interface adapted to receive said plurality of synchronized parallel data streams and to multiplex said plurality of parallel data streams into said high speed data stream (paragraph [0111]).

However Barlev does not explicitly disclose each packet having a stream identifier and a packet number a deframer adapted to receive said parallel streams of packets, and to synchronize packets from said parallel streams based on said stream identifiers and packet numbers; or that the data streams demodulated by the modems corresponds to approximately 13 Mbps.

In the same field of endeavor Pedersen discloses a frame header that includes a packet index number (Sequence Number) and a packet stream number (User Flow Identification)corresponding to its respective data stream (figure 5 and column 7 line 30-column 8 line 24) and a deframer (Bonded Link Interface 26 in figure 1B)adapted to receive said parallel streams of packets, and to synchronize packets from said parallel streams based on said stream identifiers and packet numbers (column 6, line 67-column 7, line 67).

Therefore it would have been obvious to a person of ordinary skill in the art at the

time the invention was made to include a packet index number and a packet stream number corresponding to its respective data stream and a deframer as disclosed by Pedersen in the system of Barlev in order to efficiently utilize the available link capacity and more fluidly handle differences in link speed.

Regarding the data rate demodulated by the modems corresponding to 13 Mbps, it is obvious that if overhead is added to each packet (e.g. in the form of a sequence number and a stream number) then the data rate is bound to increase. However the Applicants have not disclosed that having an overhead of approximately 2 Mbps provides an advantage. One of ordinary skill in the art, furthermore would have expected Applicants' invention to perform equally well with the overhead as taught by Pedersen because both overheads perform the same function of re-sequencing the data flows transmitted across twisted pairs.

Therefore, it would have been obvious to one of ordinary skill in the art to modify Pedersen to obtain the invention as specified in claim 1.

Consider claim 26, and as applied to claim 25 above, Barlev discloses reassembling the DS3 (high rate stream) from the parallel data streams in accordance with a round robin pattern (paragraph [0156]).

Consider claim 27 and as applied to claim 25 above, Barlev as modified by Pedersen does not specifically disclose that the plurality of synchronized parallel data steams has a data rate of approximately 11 Mbps.

In the same field of endeavor Kukic discloses that DS3 data stream (ATM data stream) is divided over several lower capacity lines whose number depends on the data

rate of these lower capacity lines and that if the received data rate is four times the optimal rate of the lower capacity lines, the incoming DS3 stream will have to be inverse multiplexed onto by four lines (11 Mbps is approximately 1/4th of a DS3).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to divide a DS3 over four lines as disclosed by Kukic in the system of Barlev a modified by Pedersen in order to optimally calculate a data rate.

8. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barlev et al. ("Barlev", United Sates Patent Application Publication No.: US 2005/0220180 A1) in view of Pedersen et al. ("Pedersen", United States Patent No.: US 7,006,500 B1) and Kukic (United Sates Patent Application Publication No.: US 2003/0169780 A1) and further in view of Wolf et al. ("Wolf", United Sates Patent Application Publication No.: US 2002/0080825 A1).

Consider claim 36 and as applied to claim 34 above, Barlev as modified by Pedersen and further modified by Kukic does not specifically disclose that the stream identifier received from each of a plurality of the four streams transmitted on respective twisted pair conductors can be used to determine that a miswire condition exists between at least two of the twisted pair conductors.

In the same field of endeavor Wolf discloses using individual bits or bit sequences or identifications codes which can be used to determine wiring errors (paragraph [0043]).

Therefore it would have been obvious to a person of ordinary skill in the art at the

time the invention was made to use identification codes as disclose by Wolf in the system of Barlev as modified by Pedersen and further modified by Kukic in order to detect wiring errors.

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barlev et al. ("Barlev", United Sates Patent Application Publication No.: US 2005/0220180 A1) in view of Pedersen et al. ("Pedersen", United States Patent No.: US 7,006,500 B1) and Somekh et al. ("Somekh", United Sates Patent No.: US 7,230,977 B1) and further in view of Peters (United Sates Patent No.: US 6,967,589 B1).

Consider claim 8 , Barlev discloses an apparatus for transmitting a high speed data stream over a plurality of twisted pair conductors comprising a high speed data interface adapted to receive said high speed data stream and to inversely multiplex said high speed data stream into a plurality of parallel data streams(SCM 274 in figure 7 and paragraphs(paragraph [0031]), [0111] and [0143]), and a plurality of modems adapted to modulate each corresponding stream of packets onto a twisted pair conductor (paragraph [0143]).

However Barlev does not explicitly disclose a framer adapted to receive each of said parallel data streams, and to generate a stream of packets, each packet having a packet index number and a packet stream identifier or having at least one switch adapted to configure said apparatus as a repeater unit or a non-repeater unit, said apparatus being operable as a repeater when said high speed data interface thereof is connected to a second said high speed data interface of a second said apparatus to

allow a high speed data stream to pass between the two said high speed data interfaces and data streams to be transmitted to and received from said plurality of modems of each of said apparatus and said second apparatus via twisted pair conductors, wherein, in each of said apparatus and said second apparatus, said plurality of modems demodulates a plurality of parallel signals received over said twisted pair conductors into a plurality of data streams each comprising a stream of packets, each said packet having a corresponding said stream identifier and said packet number, a deframer receives said parallel streams of packets and synchronizes said packets from said parallel streams based on said stream identifiers and said packet numbers, and said high speed data interface receives said plurality of synchronized parallel data streams and multiplexes said plurality of parallel data streams into a high speed data stream.

In the same field of endeavor Pedersen discloses a framer (Bonded Link Interface 26 in figure 1B) adapted to receive each of said parallel data streams (column 6, lines 63-67), and to generate a stream of packets, each packet having a packet index number (Sequence Number) and a packet stream number(User Flow Identification) corresponding to its respective said parallel data stream(figure 5 and column 7 line 30-column 8 line 24).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made for a framer to include a packet index number and a packet stream number corresponding to its respective data stream as disclosed by Pedersen in the system of Barlev in order to efficiently utilize the available link capacity

and more fluidly handle differences in link speed.

Nonetheless Barlev as modified by Pedersen does not specifically disclose having at least one switch adapted to configure said apparatus as a repeater unit or a non-repeater unit, said apparatus being operable as a repeater when said high speed data interface thereof is connected to a second said high speed data interface of a second said apparatus to allow a high speed data stream to pass between the two said high speed data interfaces and data streams to be transmitted to and received from said plurality of modems of each of said apparatus and said second apparatus via twisted pair conductors

In the same field of endeavor Somekh discloses a back-to-back modem repeater operable as a repeater when said high speed data interface 60 thereof is connected to a second said high speed data interface 68 of a second said apparatus to allow a high speed data stream to pass between the two said high speed data interfaces and data streams to be transmitted to and received from said plurality of modems of each of said apparatus and said second apparatus via twisted pair conductors (figure 4 and column 11 lines 22- 57).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to connect two terminals back-to-back as disclosed by Somekh in the apparatus of Barlev as modified by Pedersen in order to maximize the data rate.

However, the combination of Barlev , Pedersen and Somekh does not explicitly teach at least one switch adapted to configure the unit as a repeater unit or a non-

repeater.

In the same field of endeavor Peters teaches a dip switch (445 in figure 4) used to identify if a unit is acting as a repeater (column 11, lines 48-50).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a dip switch as disclosed by Peters in the apparatus of Barlev as modified by Pedersen and further modified by Somekh in order to inexpensively provide an accurate monitoring system.

10. Claims 9, 10, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barlev et al. ("Barlev", United Sates Patent Application Publication No.: US 2005/0220180 A1) in view of Pedersen et al. ("Pedersen", United States Patent No.: US 7,006,500 B1) and Somekh et al. ("Somekh", United Sates Patent No.: US 7,230,977 B1) and Peters (United Sates Patent No.: US 6,967,589 B1) and further in view of Gewin et al. ("Gewin", United Sates Patent No.: 5,060,226).

Consider claims 9 and 10, and as applied to claims 8 and 9 respectively above, the combination of Barlev as modified by Pedersen , Somekh and further modified by Peters does not explicitly disclose least one switch being further adapted to configure said apparatus as a west (LU) or east (RU) repeater unit, said west (LU) repeater unit being closest to a central office and said each (RU) repeater unit being closest to customer premises equipment or to configure said system as a first repeater or a second repeater unit .

In the same field of endeavor Gewin disclose a dip switch (52 in figure 1B) in a

loopback unit of a repeater adapted to configure said apparatus as a west (LU) or east (RU) repeater unit, said west (LU) repeater unit being closest to a central office and said each (RU) repeater unit being closest to customer premises equipment or to configure said system as a first repeater or a second repeater unit (the setting of different addresses for the different repeater units accomplishes the same purpose) (column 3 lines 1-5 and column 9 lines 53-58).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a dip switch as disclosed by Gewin in the system of Barlev as modified by Pedersen , Somekh and further modified by Peters in order to simultaneously perform a loopback from both the near and far sides of the line with respect to a given loopback unit.

Consider claims 31 and 32, and as applied to claims 8 and 31 respectively above, the combination of Barlev as modified by Pedersen , Somekh and further modified by Peters does not explicitly disclose least one switch being further adapted to configure said apparatus as a west (LU) or east (RU) repeater unit, said west (LU) repeater unit being closest to a central office and said each (RU) repeater unit being closest to customer premises equipment or to configure said system as a first repeater or a second repeater unit.

In the same field of endeavor Gewin disclose a dip switch (52 in figure 1B) in a loopback unit of a repeater adapted to configure said apparatus as a west (LU) or east (RU) repeater unit, said west (LU) repeater unit being closest to a central office and said each (RU) repeater unit being closest to customer premises equipment or to configure

said system as a first repeater or a second repeater unit (the setting of different addresses for the different repeater units accomplishes the same purpose) (column 3 lines 1-5 and column 9 lines 53-58).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a dip switch as disclosed by Gewin in the system of Barlev as modified by Pedersen , Somekh and further modified by Peters in order to simultaneously perform a loopback from both the near and far sides of the line with respect to a given loopback unit.

11. Claims 30 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barlev et al. ("Barlev", United Sates Patent Application Publication No.: US 2005/0220180 A1) in view of Pedersen et al. ("Pedersen", United States Patent No.: US 7,006,500 B1) and Somekh et al. ("Somekh", United Sates Patent No.: US 7,230,977 B1) and Peters (United Sates Patent No.: US 6,967,589 B1) and further in view of Sheets et al. ("Sheets", United Sates Patent No.: 5,437,023).

Consider claim 30 and as applied to claim 8 above Somekh discloses a first and second apparatuses configured to operate as a repeater(figure 4 and column 11 lines 22- 57). However Somekh does not explicitly disclose said repeater being connected to a second repeater.

In the same field of endeavor Sheets shows a first repeater connected to a second repeater (figure 1).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to connect a first repeater to a second repeater as disclosed by Sheets in the apparatus of Barlev as modified by Pedersen , Somekh and further modified by Peters in order to extend transmission range.

Regarding the twisted pair conductor having data rate of approximately 13 Mbps used over a maximum range of approximately 2,300 feet, Barlev further discloses that the range depends on numerous factors such as number of twisted pairs, bit date rate, desired bit error rate etc. (paragraph [0228]).

Consider claim 33 and as applied to claim 8 above the combination of Barlev as modified by Pedersen , Somekh and further modified by Peters does not explicitly disclose that said repeater is connected to a third said apparatus, said repeater is closer to a test unit and a central office than said third apparatus which is downstream and closer to customer premises equipment, said repeater and said third apparatus each being configurable to selectively pass through a received loopback code and selectively enter a loopback mode when a selected nth loopback is received without an intervening code, said third apparatus being programmed to respond to a first loopback code and said apparatus and said second apparatus in said repeater being programmed to ignore and pass through said first loopback code and to enter a loopback mode when a second subsequent loopback code is received.

In the same field of endeavor Sheets discloses disclose that said repeater is connected to a third said apparatus, said repeater is closer to a test unit and a central office than said third apparatus which is downstream and closer to customer premises

equipment, said repeater and said third apparatus each being configurable to selectively pass through a received loopback code and selectively enter a loopback mode when a selected nth loopback is received without an intervening code, said third apparatus being programmed to respond to a first loopback code and said apparatus and said second apparatus in said repeater being programmed to ignore and pass through said first loopback code and to enter a loopback mode when a second subsequent loopback code is received (figure 1 and column 10 lines 53-61).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to pass through a loopback code and to enter a loopback mode if an nth subsequent loopback code is received as disclosed by Sheets in the system of Barlev as modified by Pedersen , Somekh and further modified by Peters in order to execute a loopback command without causing other line elements to enter loopback as well.

12. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barlev et al. (“Barlev”, United Sates Patent Application Publication No.: US 2005/0220180 A1) in view of Pedersen et al. (“Pedersen”, United States Patent No.: US 7,006,500 B1), Somekh et al. (“Somekh”, United Sates Patent No.: US 7,230,977 B1) and Peters (United Sates Patent No.: US 6,967,589 B1) and further in view of ADC Telecommunications “A” and “C”.

Consider claim 12, and as applied to claim 8 above, the combination of Barlev as modified by Pedersen , Somekh and further modified by Peters does not explicitly

disclose a front panel having a high speed data stream interface, and a rear interface, said system being adapted to switch between said front panel interface and said rear interface based on a user input.

In the same field of endeavor ADC Telecommunications “A” clearly shows a front panel having a high speed data stream interface, and a rear interface, said system being adapted to switch between said front panel interface and said rear interface when inserted in the chassis shown in ADC Telecommunications “C”.

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provision both front and real high speed interfaces that could be selected by the user as disclosed by ADC Telecommunications “A” and “C” in the system Barlev as modified by Pedersen , Somekh and further modified by Peters in order to accommodate for different installations.

Consider claim 13, and as applied to claim 12 above, the combination of Barlev as modified by Pedersen , Somekh and Peters and further modified by ADC Telecommunications “A” and “C” further disclose wherein the user input is an information bit in a back plane (ADC Telecommunications “A” clearly show a repeater module comprising a front panel having a high speed data stream interface, and a rear interface. Said rear interface is designed to fit into a connector in the back plane of a chassis thereby selecting said rear interface as shown in ADC Telecommunications “C”).

13. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barlev et al. ("Barlev", United Sates Patent Application Publication No.: US 2005/0220180 A1) in view of Pedersen et al. ("Pedersen", United States Patent No.: US 7,006,500 B1), Somekh et al. ("Somekh", United Sates Patent No.: US 7,230,977 B1) and Peters (United Sates Patent No.: US 6,967,589 B1) and further in view Stearns (United Sates Patent No.: US 7,058,011B1).

Consider claim 16 and as applied to claim 8 above, Barlev as modified by Pedersen , Somekh and further modified by Peters does not specifically disclose the apparatus being adapted to perform 1:1 protection switching and said apparatus being a redundant, non-repeater unit, or the processor being further adapted to switch between an active mode, and a standby mode for protection switching.

In the same field of endeavor Stearns discloses a line unit being adapted to perform 1:1 protection switching and said line unit being a redundant, non-repeater unit, and a processor being further adapted to switch between an active mode, and a standby mode for protection switching (column 1, lines 51-61 and column 2, lines 35-43).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform 1:1 protection switching in a line unit and said line unit being a redundant, non-repeater unit, and a processor being further adapted to switch between an active mode, and a standby mode for protection switching as disclose by Stearns in the apparatus of Barlev as modified by Pedersen , Somekh and further modified by Peters in order to provide a protection mechanism for the traffic

carried.

14. Claims 17-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barlev (United Sates Patent Application Publication No.: US 2005/0220180 A1) in view of Pedersen (United States Patent No.: US 7,006,500 B1), Somekh (United Sates Patent No.: US 7,230,977 B1) and Peters (United Sates Patent No.: US 6,967,589 B1) and further in view Koenig (United Sates Patent No.: US 6,275,510 B1).

Consider claims 17-23, and as applied to claim 8 above, Barlev as modified by Pedersen , Somekh and further modified by Peters clearly discloses a system for transmitting high speed data over a plurality of relatively low bandwidth unshielded twisted copper pairs.

However Barlev as modified by Pedersen , Somekh and further modified by Peters does not disclose comprising LEDs adapted to display loss of signal status, or a loopback mode status, or a remote alarm status, or a normal operation status, or a standby mode status, or a system failure status, or a status of one of the plurality of parallel data streams.

In the same field of endeavor Koenig clearly show a front panel of a DS3 multiplexer with LEDs adapted to display loss of signal status, or a loopback mode status, or a remote alarm status, or a normal operation status, or a standby mode status, or a system failure status, or a status of one of the plurality of parallel data streams (figure 24).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have LEDs adapted to display loss of signal status, or a loopback mode status, or a remote alarm status, or a normal operation status, or a standby mode status, or a system failure status, or a status of one of the plurality of parallel data streams as disclosed by Koenig in the system of Barlev as modified by Pedersen , Somekh and further modified by Peters for the purpose of assisting in testing of a telecommunications equipment.

Consider claim 24, and as applied to claim 23 above, Koenig clearly shows a front panel of a DS3 multiplexer with LED's adapted to display a loss of signal status corresponding to each of the parallel data streams (figure 24).

Allowable Subject Matter

15. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Consider claim 2 and as applied to claim 1, even though a 64 byte packet is common in the prior art as well as mechanisms for detecting the beginning of a packet and tracking a sequence of packets, the particular limitations in claim 2 were not found in the prior art.

Response to Arguments

16. Regarding claims 1 and 34 the Applicants basically argue that Kukic does not disclose a DS3 stream nor parallel data streams. The Examiner respectfully disagrees with the Applicants' argument because Kukic does disclose a DS3 stream and parallel

data streams. Kukic clearly shows and discloses two inverse multiplexers 20 and 22 in figure 1 connected by parallel data streams carried by physical communications links 28a-n (see paragraph [0015]). Kukic further teaches (in paragraph [0018]) that the links 28a-n may be physically combined, for all or part of the path between the two inverse multiplexers, onto a higher capacity physical communication link such as a DS3 link which means that ATM communication link 50 can be a DS3 stream.

The Applicants also argue that the bonded link interface 26 in Pedersen does not teach receiving each of plural inversely multiplexed parallel streams. The Examiner respectfully disagrees with the Applicants' argument because Pedersen does teach receiving each of plural inversely multiplexed parallel streams. Each of the parallel data streams carried by physical links 30 correspond to a higher bandwidth logical link that has been inverse multiplexed in order to be transmitted from a first bonded link transmit/receive unit 20a to a second bonded link transmit/receive unit 20b (see figure 1 and column 4, lines12-44).

Regarding claims 6, 26 and 37, the Applicants basically argue that Sheets teaches away from the claimed invention. The Examiner respectfully disagrees; Sheets teaches passing through, from one repeater to the next, a received loopback code , which is the address of the particular repeater required to loopback. This loopback code is transmitted for three seconds in order to ensure correct reception by the target repeater.

Regarding claim 25, the Applicants argue that the bonded link interface 26 in Pedersen does not teach receive parallel streams of packets. The Examiner respectfully

disagrees because Pedersen clearly shows and discloses in figure 1 and column 4 lines 13-44 a plurality of physical links 30 (parallel streams of packets) being received by a bonded link unit 20a-b via a plurality of bonded link interfaces 26.

The Applicants also argue that the clamed invention is useful for transporting data over a short range (e.g., a maximum distance of 2300 feet) whereas the HSAS disclosed by Barlev is only for a link from the CO to the node and not a link over the relatively short distance drop segment. i.e., from the node to the user. The Examiner respectfully disagrees because Barlev explicitly discloses that the invention is not limited to applications over the local loop plant, but may be used in any environment having a plurality of copper lines, such as a large building.

Regarding claim 8, the Applicants basically argue that the high-speed modems 60 and 68 in Somekh does not each comprise a high speed data interface, a framer and a plurality of modems. However the Examiner has relied on Somekh to teach a repeater configuration wherein the high-speed side of one device is connected to the high-speed side of the other device as shown in figure 4. The plurality of modems is taught by Barlev in paragraph [0143] and the framer is taught by Pedersen in figure 1B and column 6, lines 63-67.

The Applicants further argue that Peters fails to disclose a repeater as claimed. However the Examiner has relied on Peters to read on the limitation “at least one switch adapted to configure said apparatus as a repeater or a non-repeater unit”, and Peter teaches said claimed limitation in column 11, lines 48-50.

Therefore all of the claimed limitations in claim 8 are not taught by any single

reference alone but by the combination of Barlev, Pedersen, Somekh and Peters. Claims 1, 3, 4, 6, 8-13, 16-28, 30-37 and 42 presently stand rejected. Claims 1, 6, 8, 25, 28 and 37 are independent.

Conclusion

17. Any response to this Office Action should be **faxed to** (571) 273-8300 **or mailed to**:

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to GERMAN VIANA DI PRISCO whose telephone number is (571)270-1781. The examiner can normally be reached on Monday through Friday 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rafael Perez-Gutierrez can be reached on (571) 272-7915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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/German Viana Di Prisco/
Examiner, Art Unit 2617

/Rafael Pérez-Gutiérrez/
Supervisory Patent Examiner, Art Unit 2617

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